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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,821	08/25/2003	Koichi Okawa	241794US90	1811

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EXAMINER	
MILORD, MARCEAU	

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/646,821	OKAWA ET AL.	
	Examiner	Art Unit	
	Marceau Milord	2682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1- 9 are rejected under 35 U.S.C. 103(a) as being unpatentable Nakano et al (US Patent No 6011787) in view of Tsutsui et al (US Patent No 6385181 B1).

Regarding claim 1, Nakano et al discloses a radio communication method (figs. 1, 9-11) comprising the steps of: notifying a receiving function showing that it is possible to receive directional beams, from a first mobile station which can receive directional beams to a first base station which can receive directional beams (col. 3, line 43- col. 4, line 32); changing a format of an individual channel which is to be transmitted using directional beams by the first base station (col. 5, line 58- col. 6, line 4; col. 13, lines 1-28).

However, Nakano et al does not specifically disclose the steps of notifying a downlink transmission method showing that directional beams are to be transmitted in a downlink, from the first base station to the first mobile station; transmitting the individual channel using

directional beams, from the first base station to the first mobile station; and performing channel estimation using pilot symbols inserted into the individual channel, in accordance with the downlink transmission method.

On the other hand, Tsutsui et al, from the same field of endeavor, discloses array antenna system of a wireless base station in CDMA mobile communications has a beam former for forming a plurality of electric beams by applying beam forming to multipath signals received by a plurality of antenna elements of an array antenna and inputting the beams to despreading/delay-adjusting units (fingers) provided for respective path of multipaths. Each finger despreads each of the plurality of beams input thereto. A beam selector selects despread signals for which desired signal components are large from all beams of all paths, a combiner weights and combines the selected despread signals, and an decision unit decides data based upon the combined signal (col. 4, line55- col. 5, line 28). In addition, includes a channel estimation unit to which the despread signals selected by the beam selector are input. Each channel estimation unit, which has a channel estimating arithmetic unit CHE and a multiplier MPL, estimates and outputs the signal wave component corresponding to its own channel (col. 7, line 53- col. 8, line 31; col. 9, lines 34-61). Furthermore, the array antenna system further includes a searcher for measuring time intervals at which each multipath signal occurs, and inputting despread start timing and a delay time signal to the despreading/delay-adjusting unit provided for each path of the multipaths (col. 5, line 29- col. 6, line 26). The searcher measures and preserves delay profiles indicating temporal transitions of levels of all beams output by the beam former, and detects, on a per-beam basis, a path for which the beam level is high from the delay profile of each beam (col. 5, line 29- col. 6, line 26). Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to apply the technique of Tsutsui to the communication system of Nakano in order to use adaptive antennas to transmit signals in wideband DS-CDMA systems for the purpose of improving the transmission quality and the reception characteristic.

Regarding claims 2-7, Nakano et al discloses a base station (fig. 1) comprising: an individual channel transmitter configured to transmit an individual channel into which pilot symbols are inserted (col. 3, line 43- col. 4, line 32); and an individual channel format creator configured to create a format of the individual channel (col. 5, line 58- col. 6, line 4; col. 13, lines 1-28).

However, Nakano et al does not specifically disclose the features of an individual channel format creator changes between a format of an individual channel which is to be transmitted using directional beams and a format of an individual channel which is to be transmitted using non-directional beams; downlink transmission method notifier configured to notify a downlink transmission method showing that directional beams or non-directional beams are to be transmitted in a downlink, wherein the individual channel format creator changes the format of the individual channel, in accordance with transmission rate of the individual channel; wherein the individual channel format creator increases the number of pilot symbols which are to be inserted into one slot of the individual channel, when the individual channel is transmitted using directional beams.

On the other hand, Tsutsui et al, from the same field of endeavor, discloses array antenna system of a wireless base station in CDMA mobile communications has a beam former for forming a plurality of electric beams by applying beam forming to multipath signals received by a plurality of antenna elements of an array antenna and inputting the beams to despreading/delay-

adjusting units (fingers) provided for respective path of multipaths. Each finger despreads each of the plurality of beams input thereto. A beam selector selects despread signals for which desired signal components are large from all beams of all paths, a combiner weights and combines the selected despread signals, and an decision unit decides data based upon the combined signal (col. 4, line55- col. 5, line 28). In addition, includes a channel estimation unit to which the despread signals selected by the beam selector are input. Each channel estimation unit, which has a channel estimating arithmetic unit CHE and a multiplier MPL, estimates and outputs the signal wave component corresponding to its own channel (col. 7, line 53- col. 8, line 31; col. 9, lines 34-61). Furthermore, the array antenna system further includes a searcher for measuring time intervals at which each multipath signal occurs, and inputting despread start timing and a delay time signal to the despreading/delay-adjusting unit provided for each path of the multipaths (col. 5, line 29- col. 6, line 26). The searcher measures and preserves delay profiles indicating temporal transitions of levels of all beams output by the beam former, and detects, on a per-beam basis, a path for which the beam level is high from the delay profile of each beam (col. 5, line 29- col. 6, line 26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Tsutsui to the communication system of Nakano in order to use adaptive antennas to transmit signals in wideband DS-CDMA systems for the purpose of improving the transmission quality and the reception characteristic.

3. The base station according to claim 2, further comprising: a downlink transmission method notifier configured to notify a downlink transmission method showing that directional beams or non-directional beams are to be transmitted in a downlink.

Regarding claims 8-9, Nakano et al discloses a mobile station (fig. 1) comprising: a channel estimator configured to perform channel estimation using pilot symbols (col. 3, line 43- col. 4, line 32); a downlink transmission method receiver configured to receive a downlink transmission method (col. 5, line 58- col. 6, line 4; col. 13, lines 1-28).

However, Nakano et al does not specifically disclose the features of a channel switcher configured to switch between channel estimation using pilot symbols inserted into an individual channel and channel estimation using pilot symbols inserted into a common pilot channel, in accordance with the downlink transmission method; a receiving function notifier configured to notify a receiving function showing whether it is possible to receive directional beams or not.

On the other hand, Tsutsui et al, from the same field of endeavor, discloses array antenna system of a wireless base station in CDMA mobile communications has a beam former for forming a plurality of electric beams by applying beam forming to multipath signals received by a plurality of antenna elements of an array antenna and inputting the beams to despreading/delay-adjusting units (fingers) provided for respective path of multipaths. Each finger despreads each of the plurality of beams input thereto. A beam selector selects despread signals for which desired signal components are large from all beams of all paths, a combiner weights and combines the selected despread signals, and an decision unit decides data based upon the combined signal (col. 4, line55- col. 5, line 28). In addition, includes a channel estimation unit to which the despread signals selected by the beam selector are input. Each channel estimation unit, which has a channel estimating arithmetic unit CHE and a multiplier MPL, estimates and outputs the signal wave component corresponding to its own channel (col. 7, line 53- col. 8, line 31; col. 9, lines 34-61). Furthermore, the array antenna system further includes a searcher for measuring

time intervals at which each multipath signal occurs, and inputting despread start timing and a delay time signal to the despreading/delay-adjusting unit provided for each path of the multipaths (col. 5, line 29- col. 6, line 26). The searcher measures and preserves delay profiles indicating temporal transitions of levels of all beams output by the beam former, and detects, on a per-beam basis, a path for which the beam level is high from the delay profile of each beam (col. 5, line 29- col. 6, line 26). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Tsutsui to the communication system of Nakano in order to use adaptive antennas to transmit signals in wideband DS-CDMA systems for the purpose of improving the transmission quality and the reception characteristic.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marceau Milord whose telephone number is 571-272-7853. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on 571-272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

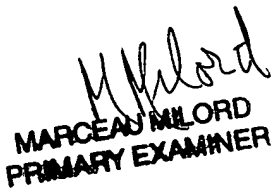
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MARCEAU MILORD

Marceau Milord

Primary Examiner

Art Unit 2682



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